B What is claimed is
~~CLAIMS~~

1. A vector for trapping an unknown gene of *Drosophila melanogaster*, which is a recombinant plasmid comprising the following nucleotide sequences in this order:

an artificial consensus splicing acceptor site;

a synthetic "stop/start" sequence;

a reporter gene;

a drug resistance gene;

a gene responsible for a detectable phenotype of the *Drosophila melanogaster*; and

a synthetic splicing donor site.

2. The vector of claim 1, wherein the recombinant plasmid is derived from pCasper3.

3. The vector of claim 1 ~~or 2~~, wherein the reporter gene is the Gal4 gene.

4. The vector of claim 3, which has the nucleotide sequence of SEQ ID No. 1.

5. The vector of claim 1 ~~or 2~~, wherein the reporter gene is Gal4 DNA binding domain-P53 fusion gene.

6. The vector of claim 1 ~~or 2~~, wherein the reporter gene is the Gal4-firefly luciferase fusion gene.

7. The vector of ~~any one of~~ claims 1~~-6~~, wherein the gene responsible for a detectable phenotype of the *Drosophila melanogaster* is mini-white gene.

8. The vector of ~~any one of~~ claims 1~~-7~~, wherein the drug resistance gene is neomycin-phosphotranspherase gene and its promoter is a heatshock promoter.

9 A vector derived from pCasperhs, which has the heatshock promoter directed Gal4 activator domain-large T antigen fusion gene within polycloning site of the pCasperhs.

10. A method for trapping an unknown gene of *Drosophila melanogaster* by using a vector which is a recombinant plasmid comprising the following nucleotide sequences in this order:

an artificial consensus splicing acceptor site;

a synthetic "stop/start" sequence;

a reporter gene;

a drug resistance gene;

a gene responsible for a detectable phenotype of the *Drosophila melanogaster*; and

a synthetic splicing donor site,

which method comprises the steps of:

(a) introducing the vector into the genome of a white minus fly;

(b) selecting primary transformants resistant to a drug;

(c) crossing the primary transformants with a transposase source strain to force the vector to jump into other locations;

(d) selecting secondary transformants by picking up the flies having strong eye color,

(e) crossing the secondary transformants with UAS (Upstream Activator Sequence)-luciferase harboring strain and measuring

the reporter gene expression of the resultant flies; and

(f) identifying the trapped gene by cloning and sequencing the cDNAs fused to the reporter gene and the gene responsible for a detectable phenotype of the fly.

11. The method according to claim 10, wherein the recombinant plasmid is derived from pCasper3.

12. The method according to claim 10 ~~or 11~~, wherein the reporter gene in the vector is the Gal4 gene, and in the step (e) the Gal4 expression is measured.

13. The method according to claim 10 ~~or 11~~, wherein the reporter gene of the vector is the Gal4-firefly luciferase fusion gene, and in the step (e) expression of said fusion gene is measured without crossing the secondary transformants with UAS-luciferase harboring strain.

14. The method according to ~~any one of~~ claims 10 ~~to 14~~, wherein the gene responsible for a detectable phenotype of the *Drosophila melanogaster* is mini-white gene, and in the step (f) the cDNAs fused to the reporter gene and the mini-white gene are cloned and sequenced.

15. The method according to ~~any one of~~ claims 10 ~~to 15~~, wherein the drug resistance gene is neomycin-phosphotranspherase gene and its promoter is a heatshock promoter, and in the step (b) the transformants resistant to G418 is selected.

16. A method for trapping an unknown gene of *Drosophila*

melanogaster by using a vector A which is a recombinant plasmid comprising the following nucleotide sequences in this order:

an artificial consensus splicing acceptor site;

a synthetic "stop/start" sequence;

Gal4 DNA binding domain-P53 fusion gene as a reporter gene;

a drug resistance gene;

a gene responsible for a detectable phenotype of the *Drosophila melanogaster*; and

a synthetic splicing donor site,

and a vector B derived from pCasperhs, which has the heatshock promoter directed Gal4 activator domain-large T antigen fusion gene within polycloning site of the pCasperhs,

which method comprises the steps of:

(a) introducing each of the vectors A and B into the genomes of separate white minus flies;

(b) selecting primary transformants for the vector A which are resistant to a drug, and selecting primary transformants for the vector B which have an eye color;

(c) crossing the primary transformants for the vector A with a transposase source strain to force the vector to jump into other locations;

(d) selecting secondary transformants for the vector A by picking up the flies having strong eye color;

(e) crossing the secondary transformants with the primary transformants for the vector B to obtain flies harboring both the vectors A and B;

(f) crossing the flies obtained in the step (e) with an UAS-luciferase harboring fly strain and measuring the reporter gene expression of the resultant flies after a

heatshock treatment; and

(g) identifying the trapped gene by cloning and sequencing the cDNAs fused to the reporter gene and the gene responsible for a detectable phenotype of the fly.

17. The method according to claim 16, wherein the vector A is derived from pCasper3.

18. The method according to claim 16 ~~or 17~~, wherein the gene responsible for a detectable phenotype of the *Drosophila melanogaster* is mini-white gene, and in the step (g) the cDNAs fused to the reporter gene and the mini-white gene are cloned and sequenced.

19. The method according to ~~any one of~~ claims 16 ~~to 18~~, wherein the drug resistance gene is neomycin-phosphotranspherase gene and its promoter is a heatshock promoter, and in the step (b) the transformant resistant to G418 is selected.